

IN THE CLAIMS:

Please AMEND claims 1, 11, 14, 23, 29, 30, 31, and 33 in accordance with the following:

1. **(currently amended)** An optical recording medium comprising:
a wobbled track on which user data is recorded; and
a header area in which first through N header information are recorded as a multi-modulated signal, wherein:
the first through N header information modulated according to first through N types of modulation, respectively, overlap one another in at least some intervals of the multi-modulated signal.
2. **(previously presented)** The optical recording medium of claim 1, wherein N is 2.
3. **(original)** The optical recording medium of claim 2, wherein the first type of modulation is one of phase modulation, frequency modulation, and amplitude modulation, and the second type of modulation is one of the remaining two types of modulation not provided in the first type of modulation.
4. **(previously presented)** The optical recording medium of claim 1, wherein N is 3.
5. **(previously presented)** The optical recording medium of claim 4, wherein the first type of modulation is one of phase modulation, frequency modulation, and amplitude modulation, the second type of modulation is one of the remaining two types of modulation not provided by the first type modulation, and the third type of modulation is the last type of modulation not provided by the first and second types of modulation.
6. **(cancelled)**
7. **(original)** The optical recording medium of claim 1, wherein the header area further comprises a header flag region including a flag signal to indicate a beginning of the header area positioned between adjacent wobbled tracks.
8. **(previously presented)** The optical recording medium of claim 7, wherein the flag signal comprises a direct current signal recorded in the header flag region.

9. **(original)** The optical recording medium of claim 7, wherein the flag signal in the header flag region is a mirror region.

10. **(original)** The optical recording medium of claim 1, wherein said wobble track is a wobble signal having a single frequency.

11. **(currently amended)** The optical recording medium of claim 10, wherein ~~the a~~ header signal generated from the header area has a frequency which is higher than the single frequency of the wobble signal.

12. **(original)** The optical recording medium of claim 1, wherein said wobbled track and said header area are positioned alternately.

13. **(original)** The optical recording medium of claim 12, wherein said wobbled track comprises a user data area to record user data and includes land and groove tracks.

14. **(currently amended)** A method of recording header information in a header area on an optical recording medium on which a wobble signal is recorded, the method comprising:
generating a multi-modulated header signal wherein first through N header information, recorded in the header area, modulated according to first through N types of modulation, respectively, overlap one another in at least some intervals of the multi-modulated header signal;
and

recording the generated header signal on the optical recording medium.

15. **(previously presented)** The method of claim 14, wherein N is 2.

16. **(original)** The method of claim 15, wherein the first type of modulation is one of phase modulation, frequency modulation, and amplitude modulation, and the second type of modulation is one of the remaining two types of modulation not provided in the first type of modulation.

17. **(previously presented)** The method of claim 14, wherein N is 3.

18. **(cancelled)**

19. **(previously presented)** The method of claim 17, wherein the first type of modulation is one of phase modulation, frequency modulation, and amplitude modulation, the second type of modulation is one of the remaining two types of modulation not provided in the first type of modulation, and the third type of modulation is the last type modulation not provided in the first and second types of modulation.

20. **(original)** The method of claim 14, wherein the wobble signal has a single frequency.

21. **(original)** The method of claim 20, wherein the header signal has a frequency higher than the single frequency of the wobble signal.

22. **(original)** The method of claim 14, wherein the wobbled track and the header area are positioned alternately.

23. **(currently amended)** An apparatus to record a header signal in a header area on an optical recording medium on which a wobble signal is recorded, the apparatus comprising:

a multi-modulator to generate a multi-modulated header signal wherein:

first through N header information, recorded in the header area, modulated according to first through N types of modulation, respectively, overlap one another in at least some intervals of the multi-modulated header signal; and

a recording unit to record the generated multi-modulated header signal.

24. **(previously presented)** The apparatus of claim 23, wherein N is 2.

25. **(previously presented)** The apparatus of claim 23, wherein N is 2 and said multi-modulator comprises:

a first modulator to modulate the first header information according to the first type of modulation;

a second modulator to modulate the second header information according to the second type of modulation; and

a signal synthesizer to overlap signals output from the first and second modulators in the at least some intervals of the modulated header signals.

26. **(original)** The apparatus of claim 25, wherein the first type of modulation is one of

phase modulation, frequency modulation, and amplitude modulation, and the second type of modulation is one of the remaining two types of modulation not provided in the first type modulation.

27. **(previously presented)** The apparatus of claim 23, wherein N is 3 and the multi-modulator comprises:

a first modulator to modulate the first header information according to the first type of modulation;

a second modulator to modulate the second header information according to the second type of modulation;

a third modulator to modulate the third header information according to the third type of modulation; and

a signal synthesizer to overlap signals output from the first through third modulators in the at least some intervals of the modulated header signals.

28. **(previously presented)** The apparatus of claim 27, wherein each modulator performs a different one of phase modulation, frequency modulation, and amplitude modulation.

29. **(currently amended)** A method of reproducing header information from a header area on an optical recording medium on which a wobble signal is recorded, the method comprising:

reading a multi-modulated header signal wherein first and second header information, recorded in the header area, modulated according to first and second types of modulation, respectively, overlap one another in at least some intervals of the multi-modulated header signal;

demodulating the read header signal according to a first type of demodulation to obtain the first header information;

demodulating the read header signal according to a second type of demodulation to obtain the second header information; and

combining the demodulated first and second header information, to output combined header information.

30. **(currently amended)** A method of reproducing header information from a header area on an optical recording medium on which a wobble signal is recorded, the method comprising:

reading a multi-modulated header signal wherein first, second and third header information, recorded in the header area, modulated according to first, second and third types of

modulation, respectively, overlap one another in at least some intervals of the multi-modulated header signal;

demodulating some of the intervals of the read header signal according to a first type of demodulation to obtain the first header information;

demodulating the intervals according to a second type of demodulation to obtain the second header information;

demodulating the intervals according to a third type of demodulation to obtain the third header information; and

combining the demodulated first, second and third header information to output combined header information.

31. **(currently amended)** An apparatus to reproduce header information from a header area on an optical recording medium on which a wobble signal is recorded, the apparatus comprising:

a reading unit to read a multi-modulated header signal wherein first, and second and third header information, recorded in the header area, modulated according to first, and second and third types of modulation, respectively, overlap one another in at least some intervals of the multi-modulated header signal;

a first demodulator to demodulate at least some intervals of the read header signal according to a first type of demodulation and to obtain the first header information;

a second demodulator to demodulate the intervals according to a second type of demodulation and to obtain the second header information; and

a header information synthesizer to combine the first and second header information and to output combined header information.

32. **(original)** The apparatus of claim 31, further comprising a third demodulator demodulating the intervals according to a third type of demodulation to obtain third header information, wherein the header information synthesizer combines the third header information with the first and second header information.

33. **(currently amended)** An apparatus to record a header signal on and reproduce header information from a header area on an optical recording medium on which a wobble signal is recorded, the apparatus comprising:

a header signal recorder comprising:

a multi-modulator to generate a multi-modulated header signal wherein first and

second header information, recorded in the header area, modulated according to first and second types of modulation, respectively, overlap one another in at least some intervals of the multi-modulated header signal;

a recording unit to record the generated multi-modulated header signal on the optical recording medium; and

a header signal reproducer comprising:

a reading unit to read the multi-modulated header signal from the recording medium;

a first demodulator to demodulate at least some intervals of the read header signal according to a first type of demodulation and to obtain the first header information;

a second demodulator to demodulate the intervals according to a second type of demodulation and to obtain the second header information; and

a header information synthesizer to combine the first and second header information and to output the combined header information.